

## **INTERFACIAL STRENGTHENING FOR ELECTROLESS NICKEL IMMERSION GOLD SUBSTRATES**

### **ABSTRACT OF THE DISCLOSURE**

5        A flip chip package, apparatus and technique in which a ball grid array composed of a doped eutectic Pb/Sn solder composition is used. The dopant in the Pb/Sn solder forms a compound or complex with the phosphorous residue from the electroless nickel plating process that is mixable with the Pb/Sn solder. The phosphorous containing compound or complex prevents degradation of the  
10      solder/under bump metallization bond associated with phosphorus residue. The interfacial solder/under bump metallization bond is thereby strengthened. This results in fewer fractured solder bonds and greater package reliability.